Amendments to the Specification:

Please insert the following government statement after the Title of the Invention:

GOVERNMENT STATEMEMENT:

This work has been supported in part by a grant from the Office of Naval Research under grant number N00014-98-1-0848. The United States Government may have certain rights to this invention.

Please amend the following numbered paragraphs of the specification as indicated:

[0011] The novel method for providing an energy reservoir of compressed fluid on demand includes the steps of positioning a phase change material in a constant volume container and activating a phase change in the phase change material. The pressure in the container thus increases in accordance with ~~Boyle's~~the combined gas law.

[0030] An integrated pump includes a pressure source and an integrated particulate filter. It pumps clean gas or liquid into separation systems such as chromatographic columns. The material used for actuation is any material that transitions through a phase change in a confined, constant volume, resulting in a pressure increase in accordance with ~~Boyle's~~the combined gas law. More particularly, the material may be any reactive material such as pyrotechnic powders, plastic based explosives, binary reactant explosives/propellants, hypergolic reactant propellants, catalytic reactants, combustion reactants or other phase change material.

[0034] The phase change ~~enables a volume expansion~~is an explosion within a constrained vessel creating a desired high pressure that provides the motive force for fluid transfer, actuation and stored energy for subsequent energy conversion. Significantly, the high pressure is not generated until it is needed, thereby eliminating the prior art need to have gases or liquids maintained in pressure vessels over long periods of time until such pressure is needed.

[0043] More particularly, the structure of system 50 is the same as that of system 30 of Fig. 2, but with the addition of a pair of branches 52, 54 that provide fluid communication between pump or turbine 34 and pneumatic circuit 56 or hydraulic circuit 58, respectively, or both. Pneumatic circuit 56 is positioned in driving relation to mechanical loads 56a, fluidic loads56b, or other pressure-driven loads 56c. Hydraulic circuit 58 is also positioned in driving relation to

mechanical loads 58a, fluidic loads 58b, or other pressure-driven loads 58c. Valves 53 and 55 are closed when gaseous fluids are created by an explosion in container 32. The expanding gases that are not used to operate the turbine or pump in container 34 flow into high pressure container 40. When the gases under high pressure in container 40 are needed to operate a pneumatic load, valve 53 is opened so that high pressure gases flow into pneumatic circuit 56. As is well-known, a pneumatic circuit such as pneumatic circuit 56 may be employed to operate mechanical loads 56a, fluidic loads 56b, or other pressure-driven loads 56c as aforesaid. In the alternative, when container 34 houses a hydraulically-operated load, the expanding gases created by the explosion in container 32 drive hydraulic fluid from container 34 into a hydraulically-operated load. The hydraulic fluid not needed to operate said hydraulic load is delivered to high pressure container 40, it being understood that valves 53 and 55 are closed when the explosion is initiated. Thereafter, when work requiring hydraulic fluid under pressure is required, high pressure hydraulic fluid in container 40 is delivered to hydraulic circuit 58 by opening valve 55. As is well-known, a hydraulic circuit such as hydraulic circuit 58 may be employed to operate mechanical loads 58a, fluidic loads 58b, or other pressure-driven loads.

[0044] Fig. 4 depicts an AC flow, pressure on demand, microbattery 60. Current is generated by oscillation of magnetic core 62 in and out of coil 64. Fluidic oscillator 66 alternates the flow of fluid into each side of flexible diaphragm 68 and moves core 62 back and forth, said magnetic core 62 being mounted on said flexible diagram 68 as depicted. Each explosive charge is actuated by a substrate 70-mounted conductor 72 that also acts as an initiator. Microbattery 60 further includes cap layer 74, within which said coil 64 is formed, pressure cell 76, propellant mold and bond layer 78, and a plurality of propellant or explosive dots 80 formed of a phase change material. Fig. 5 depicts the invention in its simplest form. A phase change explosion occurs in constant volume container 32 and the high pressure gases generated by the explosion follow the path of least resistance out of container 32, said path of least resistance being conduit 33 that is in fluid communication with second container 34. Said second container is filled or partially filled with water 34a as depicted. When the high pressure gases enter second container 34, said high pressure gases drive water 34a out of said second container 34 through outlet conduit 35 which is in fluid communication with a water-driven load, not depicted. This arrangement of parts avoids the need to use second container 34 as a storage container for water under high pressure. Instead, said second container 34 merely stores water under atmospheric

pressure. When water under high pressure is needed, an explosion is triggered in constant volume container 32, thereby converting the low pressure in second container 34 into high pressure that forces water 34a in said second container 34 to exit therefrom, following the path of least resistance represented by outlet conduit 35. Fig. 6 depicts an addressable pattern grid 60 with patterned explosive wells over intersections. A dual addressing is the actuating means that sparks the explosion at each intersection.